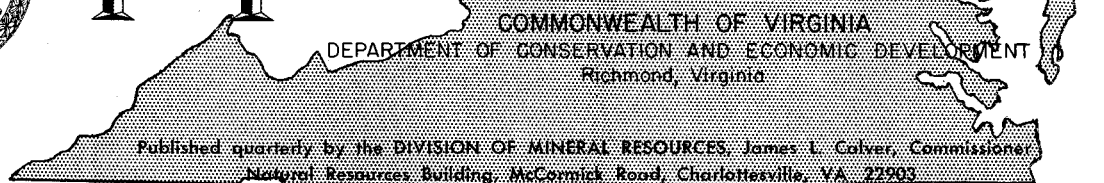


VIRGINIA



MINERALS



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GOLD MINES AND PROSPECTS IN VIRGINIA

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INTRODUCTION

Virginia was one of the first gold-producing states in the nation. The earliest printed reference to gold in the State was in 1782, when Thomas Jefferson reported on a gold-bearing rock, weighing four pounds, that was found on the north side of the Rappahannock River about four miles below the falls. Several lode gold mines near the falls of the James River in Amherst County, as well as several placer mines in other parts of the state, were reportedly opened about 1825 (Green, 1937, p. 232-233).

The most productive and sustained period of gold activity in Virginia was from 1830 thru 1856; the average annual value of gold produced during that period was about \$54,975 as valued at the then-current price of \$20.67 per troy ounce. The United States Bureau of Mines estimates total gold production in Virginia from 1829 through 1934 at \$3,318,388. This figure is approximately \$1,425,000 more than available records indicate; the higher value apparently allows for unrecorded production during the early boom years of gold mining in Virginia (Park, 1936, p. 8). It allows for gold that was exported, went into general and local trade, or was used in the

arts, and gold that was coined by individuals. With this figure given by the Bureau of Mines, plus the production estimated from 1804-1828 and that reported after 1934, total gold yield in Virginia has been approximately 98,609 troy ounces for a value of \$3,575,675 (Table 1).

The following descriptions are brief summaries of some of the major gold mines and prospects in the gold-pyrite belt and isolated localities of Virginia (Figure 1). Various aspects are necessarily incomplete due to contradictory data and lack of adequate reference material.

GOLD-PYRITE BELT

Whitehall mine.—Gold in place was first discovered in 1806 at the Whitehall mine, 1.5 miles northwest of Shady Grove Church in western Spotsylvania County. The mine was worked between the years 1848 and 1884; records of the Philadelphia mint report a yield of \$1,800,000 in gold during the period 1848-1881 (Watson, 1907, p. 555). Silliman (1837, p. 101) states that \$10,000 in gold was found within an area of 20 square feet at the mine in just a few days. Another report states that at a depth of 28 feet, in a space of 3 square feet, \$160,000 of pure gold

was obtained (Hotchkiss, 1881, p. 182). Gold, as well as auriferous pyrite and galena, was reportedly found in quartz veins in chloritic schists and slates.

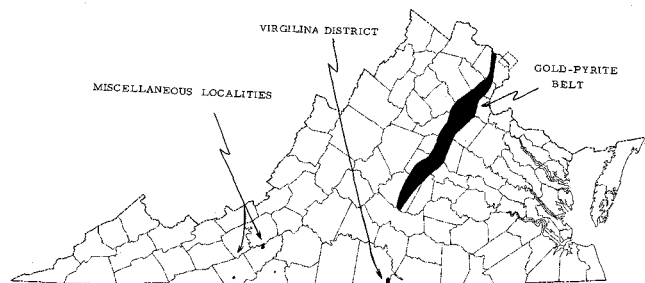


Figure 1. Map of Virginia showing areas of gold mines and prospects.

Collins mine.—The first gold discovered in the James River district of the gold-pyrite belt was probably at the Collins mine in Goochland County in 1829 (Brown, 1937, p. 33). Placer gold was found in a tributary, in the valley of Little Byrd Creek one mile northeast of Lantana and four miles south of Tabscott. Dams were built, rockers were installed, and hydraulic mining methods were utilized by various owners to work the gold-bearing gravels. Later in the nineteenth century, gold-bearing gravels were also found on the north side of the stream, 30 to 40 feet above the present stream channel. From 1934 to 1936, the Powhatan Mining Company operated a steam dragline and portable gold-saving machine to recover the gold (Luttrell, 1966, p. 35). Gravel removed from the deposits contained about .011 ounce of gold per cubic yard (Pardee and Park, 1948, p. 57). Today, the vicinity of this abandoned mine is a swamp and marsh area with a thick mat of underbrush.

Vaocluse mine.—The Vaocluse mine property of 200 acres is approximately 18 miles west of Fredericksburg in northeastern Orange County. The site is about 250 yards along a woods road off the west side of State Road 667, extended approximately 1.7 miles by road north-northeast of its intersection with State Highway 3. The mine was opened as a placer operation in 1832 in decomposed surface material. Later, as the placers were depleted, the gold-bearing lodes were mined. A large plant was utilized at the mine in the 1840's; published reports put a value of \$70,000 on the plant equipment in 1843 (Lonsdale, 1927, p. 81). In 1844, the Liberty Mining Company of London purchased the mine and de-

veloped two open cuts, each approximately 60 feet deep and 120 feet long. In 1853 it was reported that the company had extracted 556.3 ounces of gold during 80 days of milling (Pardee and Park, 1948, p. 59). In December, 1853, six shafts were open at the mine where a 50-ton mill was utilized to process ore valued at \$8 per ton (Park, 1936, p. 27). The mine continued to operate until the Civil War. In 1933-1934, Henry Ford bought the mine and removed the plant machinery to his museum in Dearborn, Michigan. The Rapidan Gold Corporation purchased the mine in 1934 and sold it to the Virginia Mining Corporation in 1935. From December, 1935 until November, 1938, the Virginia Mining Corporation utilized a flotation plant to produce about 4305.3 ounces of gold (Luttrell, 1966, p. 135). In December, 1938, the mine was closed and sold at auction.

The mine is located on the same mineralized shear zone as the Melville mine, about one mile to the northeast. Quartz lenses, which average about 50 feet in length and 4 feet in thickness, reportedly contain gold intimately associated with pyrite and small amounts of chalcopyrite and galena, in a quartz-sericite-chlorite schist, which is more massive here than at the Melville mine. Common gangue minerals include chlorite, calcite, and ankerite (Luttrell, 1966, p. 135). No equipment or machinery is left at the site of this mine; several large house-size open pits give a miniature mountain and valley aspect to the area.

Tellurium mine.—One of the first areas at which vein gold-mining was attempted was the Tellurium mine, 2.5 miles southwest of Tabscott on both sides of a forest-fire road approximately 0.55 mile by road northwest of its intersection with State Road 605, lying in contiguous parts of Fluvanna and Goochland counties. The vein mineralization was discovered in 1832 and operations began in 1834. The gold ore was crushed by hand and then washed in a box to separate the waste material. The ore was pulverized in a circular rock-lined pit by stones attached to horizontal poles fastened in a central pillar and dragged around the pit by horses; this device is called an *arrastra*. About this time a small stamp mill, or pounding mill, was built near the mine to crush the gold ore; this was probably the first mill of this type to be erected in the United States. The ore was placed on an iron-die plate and crushed by 50-pound wooden stamps with iron shoes. Six stamps were reported in operation at the mine in 1836 (Taber, 1913, p. 153). For 14 years gold

was extracted from the "Little" and "Middle" veins. Gold ore in these two veins was reported to have had a minimum value of \$5 per ton and a maximum of \$300 per ton; the average value of the ore was \$100 per ton (Watson, 1907, p. 559).

In 1848 the mine ownership was transferred and a 40-stamp mill was erected. For the next nine years most of the mining was from the "Big Sandstone" vein, a ledge of quartzite averaging about 3 feet in width, which contained small gold-bearing stringers. Gold ore from this vein was estimated to average about \$20 per ton (Watson, 1907, p. 560). In 1857 the mill was destroyed by fire. Estimates of gold extracted from the mine until the fire range from \$75,000 to over \$1,000,000 (Taber, 1913, p. 154). The mine was reopened in 1880 with a 10-stamp mill and copper plates for amalgamation. Very little gold was recovered, as was also the case in 1890 when several steam stamps were installed. The Argus Gold Mining Corporation reworked the "Middle" and "Big Sandstone" veins in 1909-1910. The last operator at the mine was the Tellurium Gold Mining Co., which reopened the mine in 1935 and erected a 3-stamp mill in 1937.

The three major veins are enclosed in fine-grained garnetiferous quartz-sericite schist inter-layered with fine-grained quartz containing hematite and magnetite. The quartz lenses and veins were said to contain kaolinized feldspar, pyrite, free gold, and a minor amount of sphalerite, tetradymite, and silver (Luttrell, 1966, p. 128). Numerous dirt-filled shafts and trenches, a few open shafts and cuts, and scattered brush-covered dumps are visible on the property. A dilapidated mill building (Figure 2) is still present, as are the



Figure 2. A building of the Tellurium gold mine, Goochland County.

concrete foundations that probably supported the stamps and equipment utilized in recovering the gold.

Moss mine.—The Moss mine is in Goochland County, 1.5 miles southeast of Tabscott and about 8 miles northeast of Columbia, and is about 0.25 mile along a fire road off the southeast side of State Road 605. Gold was discovered here in 1835. The Richmond Mining Company operated the mine from 1836 to 1838, developing two inclined shafts, 31 feet and 50 feet deep, into a vein that measured 16 to 30 feet wide at the bottom of the shaft. Several samples from the mine during the period indicated varying yields of \$7.39 per 100 pounds and \$105 per ton of gold ore (Pardee and Park, 1948, p. 56; Taber, 1913, p. 145).

The mine was reopened in 1891 when the No. 1 shaft was utilized, and was acquired by new owners in 1893. It has been reported that production during 1893 was about \$10,000. The Telluric Gold Mining Company deepened the No. 1 shaft, sank a No. 2 shaft to a depth of 130 feet and erected three additional stamps for the mill during 1902-1904. In December, 1931, the No. 1 and No. 2 shafts were reopened for exploration and a 3-stamp prospecting mill for testing the ore was also erected. Work was suspended in the spring of 1933.

In early 1936, the Moss Mining Company of Richmond acquired the mine; development took place from April 1 to November 1, 1936. This company erected a small, modern mill that utilized a jaw crusher, ball mill, classifier, Denver mineral jig (Figure 3), corduroy blankets, flotation unit, concentrate tank, amalgam drum, and amalgamat-

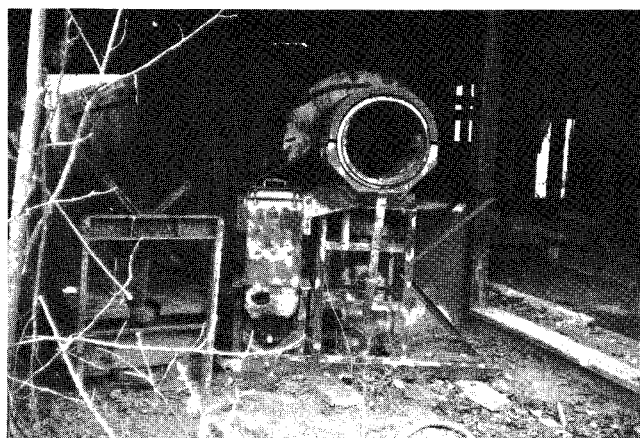


Figure 3. Denver mineral jig at the Moss Goochland County.

ing plates. In 1936, about 172 tons of ore were milled; mint returns indicate a yield of \$3,375.25 in gold. Mint returns also indicate a yield of \$906.30 in 1931 and 1932. Total gold production from the Moss mine is estimated at \$20,000-\$25,000 (Brown, 1937, p. 28-29).

The gold-bearing quartz veins were found in a shear zone along the contact between fine-grained garnetiferous quartz-sericite schist and hornblende schist. The upper 50 feet of the veins are weathered to red clay and oxidation is present to a depth of approximately 75 feet. The quartz veins contain coarse grains of free gold, pyrite, galena, and sphalerite; copper-sulfide minerals have been found in the deeper portion of the vein. The mill and shaft house (Figure 4) are still standing, and there are scattered, caved pits and overgrown brush-covered dumps.



Figure 4. Old mill and shaft house at the Moss gold mine.

Franklin mine.—One of the most notable lode-type gold mines in Virginia was the Franklin mine, on a tract of 594 acres in Fauquier County approximately 2.3 miles northeast of Morrisville, about 450 yards along a dirt road off State Road 634 approximately 1.55 miles by road east of its intersection with State Road 806. The mine was opened in 1837 and worked until 1877 when it caved and was flooded. During this period 100,000 tons of ore, said to have been valued at \$12 per ton, was removed from the mine (Lonsdale, 1927, p. 79). Although some cyaniding was attempted with the tailings in 1901 and 1902, the mine was not opened again until 1934, when drilling was done to determine the value of the gold ore. Several samples from the mine were reportedly assayed at 0.15-0.2 ounces of gold per ton. The operation closed again in late 1935. In the 1950's and

1960's there was renewed interest in the mine, but no new commercial production was established.

Massive white quartz veins at the Franklin mine occur in schistose country rock and contain carbonates, pyrite, and irregular bands of sericite schist. The veins pinch and swell into single and compound lenses, usually enclosed in schist. The gold occurs in pyrite that is closely associated with the quartz lenses and the sericite schist. A large dump area with pyrite-bearing quartz (Figure 5) is still present at this mine. Remnants of equipment utilized in the early 1960's can be seen, including several large water tanks, wooden slides and shaker screens (Figure 6) for separating gold ore from gangue material. An open cut through the schistose country rock that contains the quartz may also be observed.



Figure 5. Dump area at the Franklin gold mine, Fauquier County.



Figure 6. Gold recovery equipment utilized at the Franklin gold mine.

London and Virginia mine.—The London and Virginia (Eldridge) mine in Buckingham County is about a mile northwest of Dillwyn and joins the Buckingham mine on the southwest. The mine was known as the Eldridge mine until 1853 when it was sold to the London and Virginia Gold and Copper Mining Company, which was formed in London and incorporated in Virginia. Ore was extracted from more than 600 feet of open cuts, three shafts 150 feet deep, and underground drifts that connected with the Buckingham mine along the gold-bearing vein. The mine was closed about six years before the Civil War. The tailings at the mine have reportedly been reworked and \$10,000 in gold extracted from them (Taber, 1913, p. 184). No more production was reported until 1939-40, when the mine was reopened. In 1953 the Belville Gold Mines Ltd. (Virginia Mining Corporation) drilled exploratory holes on the property. Since then there has been some interest in the mine, but no new commercial production.

The London and Virginia vein is in a mineralized shear zone 10 miles long in silicified and sericitized schist and schistose quartzite. The gold reportedly is disseminated in the quartzite and in the vein, and is in part associated with sulfide minerals. Other minerals reported at the mine include barite, chalcocite and silver, and pod-like masses of chalcopyrite, galena and sphalerite in the centers of some of the silicified areas.

Bertha and Edith mine.—The Bertha and Edith mine in Goochland County, is located approximately 3.25 miles northeast of Columbia on the east side of Big Byrd Creek. Prior to the Civil War, placer deposits were worked along the Maple and Camp tributaries of Byrd Creek. The Bertha and Edith Gold Mining Company began development work on the property in 1877, opening the Oak Hill and Maple Branch quartz veins. A 20-stamp mill was installed to crush the ore. In 1882, the Tagus Mining and Milling Company took over the property. Some hydraulic mining was done during this period; water furnished under pressure by a pump washed gravels through sluice boxes. The company opened the Oak Hill vein for 400 feet and the Maple Branch vein was developed underground. The Rivanna Gold Mining Company reopened the Oak Hill vein in 1897 and erected a cyanide plant to treat tailings from the mill. The company also worked some of the placer gravels along Camp Branch by scraping off the overburden and washing the gravels in rockers. A fire in 1898 destroyed the entire plant and all work was discontinued. Placers on the

property were worked in 1937 and production is reported for the years 1937 through 1939.

The quartz veins contain fine-grained pyrite, free gold, and minor amounts of magnetite and kaolin. The country rocks are predominantly quartz-sericite, hornblende schists, and quartz-sericite-feldspar gneiss. The veins are located approximately 0.5 mile northwest of the contact of the schists and gneiss with the hornblendic border facies of the Columbia Granite (Luttrell, 1966, p. 19). The area has been worked by loggers and no remains of the mine are visible in the thick underbrush and tree slashings.

Melville mine.—The Melville (Rapidan) mine is in Orange County, about 175 yards along a woods road off the west side of State Road 667 extended, approximately 2.4 miles by road north-northeast of its intersection with State Highway 3. Gold was discovered at this site prior to 1885, although no records are available as to the early operators or extent of any production. In 1922, experiments were conducted at the mine to find the best method for treating the gold-sulphide ores; methods used included roasting and cyaniding (Lonsdale, 1927, p. 82). A red-brick chimney, 65 feet high and 7.5 feet square at the base, for the roasting of sulphide ore, still stands beside an old stone foundation, about 700 feet northeast of the Melville shaft (Figure 7). The Rapidan Gold Corporation developed two shafts 125 feet and 240 feet deep in 1934. The company utilized a flotation mill that could handle 75 tons of ore per day. Concentrates shipped from June 7 to December 31, 1934, contained 529 ounces of gold, valued at approximately \$18,500 (Pardee and Park, 1948, p. 58). Production from the mine continued through November, 1935, when the underground work was discontinued. Some work continued until the property was abandoned in 1938.

The gold was said to be enclosed in coarse-grained pyrite in quartz veins and lenses that occur along a mineralized shear zone 60 feet wide in chloritic quartz-biotite schist. Gangue minerals included quartz, sericite, and ankerite; minor quantities of chalcopyrite, sphalerite, galena, and pyrrhotite were also found (Luttrell, 1966, p. 93-94). The main shaft (Figure 8) has collapsed and all that is visible today are rotting boards and a dump of chlorite schist and quartz that contains some pyrite. Concrete foundations that supported the power-house equipment (Figure 9) and the mill, and piles of timbers are also present, al-

though the equipment has been removed. Numerous collapsed buildings and other caved shafts and pits can be seen through the woods. Several large (42 inches in diameter and 14 inches thick) granite, wheel-shaped stones, which were used in Chilean mills to crush the ore, can be seen near an old shaft about 200 feet northwest of the roasting stack. Zinc shavings that were probably used in cyaniding were found near the roasting stack.

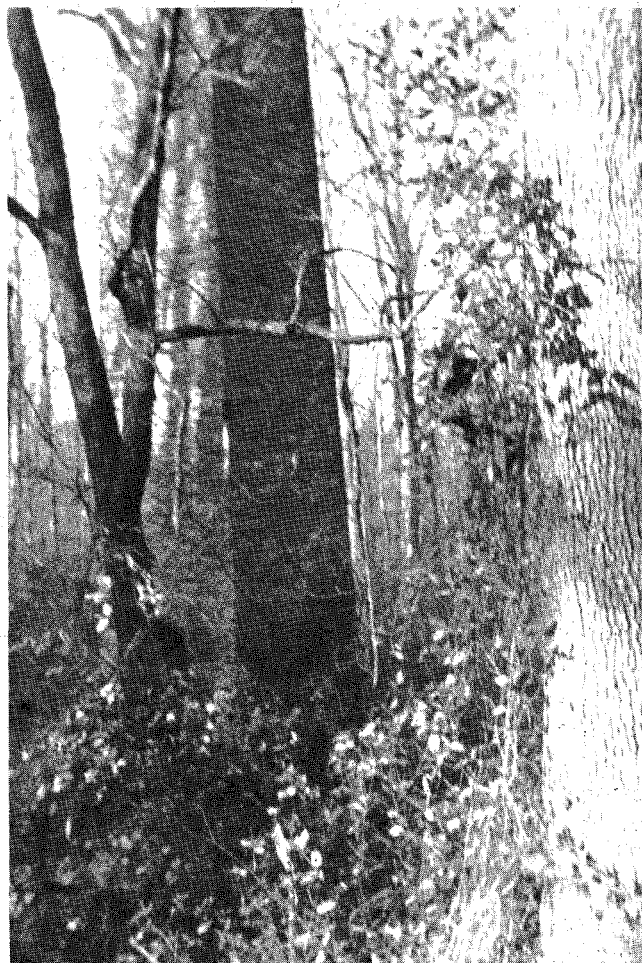


Figure 7. Brick-roasting stack at the Melville gold mine, Orange County.

Ruth mine.—The Powhatan Mining Corporation produced gold in 1935 from the Ruth placer mine, located along Byrd Creek in Goochland County near the Fluvanna County line. A dragline and portable washing plant were utilized to recover the gold. Minor amounts were produced in 1940 and 1941 and production was also recorded for about three months in 1942 from this locality.

Wilderness mine.—The Wilderness mine is located on the east side of State Road 667 approxi-

mately 0.45 mile by road northeast of its intersection with State Highway 3. It is reported that work was done on the property prior to 1911, when the Wilderness Mining and Milling Company began operation of the mine; the mill burned later that year. Some development work was done on the shaft during 1923. Ore samples have been assayed with values ranging from \$10 to \$18 per ton (Lonsdale, 1927, p. 83).

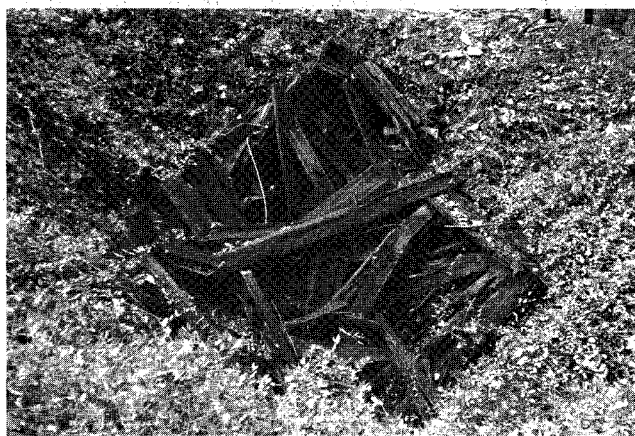


Figure 8. Caved shaft at the Melville mine.



Figure 9. Concrete foundations that supported power house-equipment, Melville mine.

Pyrite and gold reportedly were found in a quartz vein, which ranged from 4 to 13 feet in width, in a dark-gray, finely foliated, biotite-quartz-orthoclase schist (Luttrell, 1966, p. 142). Today the concrete foundations and a large dump area are still present; quartz and dark-gray schist, both containing pyrite crystals, can be found on the dump. A small, roofless block house, which may have housed either a pump utilized to remove water from the shaft or machinery for

transporting men and equipment into the mine shaft, is still standing (Figure 10).

MISCELLANEOUS OCCURRENCES

Virgilina district.—Several gold mines and prospects in southern Virginia are considered to be outside the gold-pyrite belt. Copper minerals and gold were mined in the past in the Virgilina district, which is located predominantly in eastern Halifax County, Virginia, and Person and Granville counties, North Carolina. Mineralization in the district is principally in quartz veins that are closely associated with chlorite-epidote schists known as the Virgilina greenstone, which formed largely by the metamorphism of andesite



Figure 10. Small block house and concrete foundations at the Wilderness gold mine, Orange County.

and andesitic tuffs (Laney, 1917, p. 15). The greenstone may grade into sandstone where sands were intermixed with the volcanic materials. The most abundant copper minerals include native copper, bornite, chalcocite, malachite, azurite, and chalcopyrite; these minerals occur as both primary and supergene mineralization. Native gold occurs in minor quantities in all of the mines in the Virgilina district (Laney, 1917, p. 80), and was mined a few miles northeast of Virgilina. A gold-bearing quartz fissure vein was discovered in 1903 about 4.5 miles northeast of Virgilina and just north of the now-abandoned Red Bank store. Two years later the mine was sold to the Virgilina Mining Company and was operated as the Red Bank (Goldbank) mine. The gold, associated with specular hematite, but with very little copper, was found in an almost vertical quartz vein that strikes approximately north. The quartz vein ranges from a few inches to 6 feet in width and report-

edly yielded gold ore valued at \$8 per ton across its entire width. During 1906, approximately 10 tons of ore per day were milled at the mine (Watson, 1907, p. 563). The richest parts of the vein are the reddish areas that are caused by hematite in the silicified country rock; small amounts of pyrite are also present in the upper sulphide zone. Development work until 1912 consisted of two shafts, one about 50 feet and one about 200 feet deep, with 650 feet of drifts. Total value of production until that year was \$22,000 (Laney, 1917, p. 161-162). The Red Bank mine produced minor amounts of gold in the years 1937 to 1942; this work probably extended the earlier workings. In 1942 a small amalgamation mill was utilized at the Red Bank mine. The shaft is still visible, although partly collapsed. A mill building and two batteries of five stamps each are also present on the site (Figures 11, 12). One-fourth of a mile

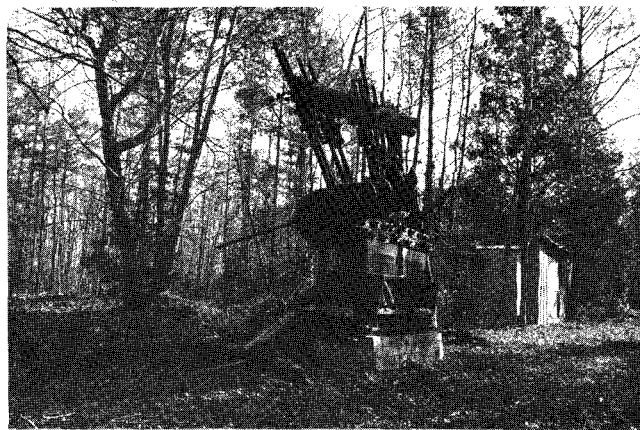


Figure 11. Stamp-mill building at the Red Bank gold mine, Halifax County.

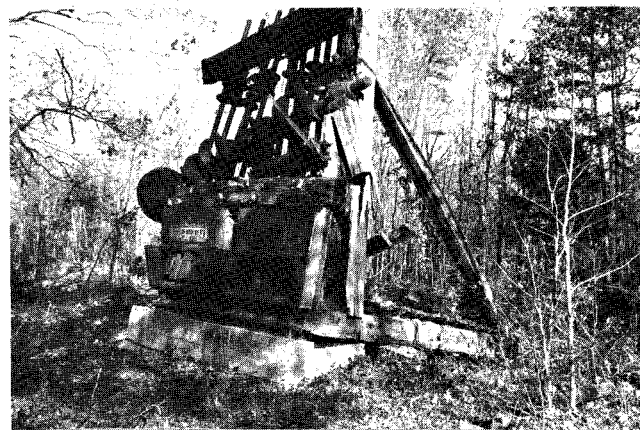


Figure 12. Two batteries of five stamps each at the Red Bank mine.

northeast of the Red Bank mine is the Luce and Howard mine. Small quantities of gold have been mined here from a quartz vein, possibly the same vein as the Red Bank mine, and from small quartz stringers in the greenstone schists. No production has been reported since 1906. Three shafts, ranging in depth to as much as 100 feet, have been sunk at the site. Several open trenches and one 30-foot open shaft can be seen. One trench has an opening near its base that may lead to an old shaft. The Poole and Harris prospect is located about three miles northeast of Virgilina and reportedly consisted of many crosscuts and shallow pits in a quartz vein in the schistose Virgilina greenstone. Today several trenches and shallow pits with small piles of quartz are present in the area.

Brush Creek prospect.—Placer deposits of gold have been worked in Montgomery County along Brush Creek and its tributaries, northwest of Laurel Ridge and southeast of Pilot Mountain. The area is known as the Brush Creek prospect. Production began in 1879 and continued intermittently into the 1920's as prospecting extended over an area 20 miles long and 4 miles wide. The Brush Creek field yielded a substantial quantity of gold in the mid-1890's, when a stamp mill was erected. More than \$30,000 of gold was reportedly removed from the field (Luttrell, 1966, p. 26).

Laurel Creek prospect.—In Floyd County, on the southeast side of Laurel Ridge, pyritic gold-bearing quartz veins occur in an area known as the Laurel Creek prospect, where gold placers were first worked in 1879.

Black Run prospect.—Farther south near the town of Floyd, the Black Run prospect is located in the bed of Black Run, which empties into Little River; this prospect consists of mineralized quartz veins 3- to 4-feet wide in mica schist. Minerals present include gold, pyrrhotite, galena, and molybdenite.

Luster McAlexander prospect.—Two miles south of the mouth of Brush Creek, gold-bearing stream alluvium was worked before 1882 at the Luster McAlexander prospect. Grains of gold found in washings of the alluvium ranged from 5 to 80 milligrams in weight.

Carroll County.—Further southwest in Carroll County, near Woodlawn, gold prospects were worked in the middle 1800's. Several pits were dug in veins of cellular quartz, containing limo-

nite, pyrite, and minor amounts of gold in hornblende-mica schists (Fontaine, 1884, p. 9).

Patrick County.—In Patrick County, gold has been prospected approximately 4.5 miles northeast of Patrick Springs. This prospect, located near Polebridge Creek, consists of several pyrite-bearing quartz veins that intrude a quartz biotite gneiss. These veins have been trenched extensively, but no gold production has been reported.

GOLD-PANNING

In Virginia, minor amounts of gold may be present in the gravels of some streams that cross gold-bearing rocks or flow through or near the old gold mines. Hobbyists occasionally pan for gold in such streams as Wilderness Run and Mine Run near the abandoned Melville, Vacluse, Wilderness, and Grasty mines in Orange County, and Byrd Creek and Little Byrd Creek in Goochland County.

A gold pan is a traditional tool in prospecting for gold. Panning is a simple and inexpensive method of separating the gold and heavy minerals, such as magnetite, garnet, and ilmenite from the silt, sand, and gravels of the stream deposits. The better gold pan consists of sheet iron with the rim turned around an iron wire for stiffness. The usual pan is 15 to 18 inches in diameter at the top and about 10 inches in diameter at the bottom; it weighs about 1.5 to 2 pounds. A trap for attracting black sands, and foam-rubber fillers that collect small, heavy particles may also be obtained. These traps and fillers fit in the bottom of the gold pan. Panning for gold is fairly simple, although it does require some patience. A pan about half full of sand is held partly submerged under the water; larger rocks and pebbles are removed by hand. The pan is then held approximately horizontal, and moved in a rotary motion, to cause the heavier particles to settle toward the bottom. Rotating and tilting the pan forward at the same time causes the lighter material to wash toward and over the rim of the pan. This action should be continued until the remaining material consists of the heavier black sands and any associated gold and possibly some very fine light sand. Inexpensive, portable sluice boxes may be made by shaping pieces of sheet metal or aluminum into troughs. The troughs are joined together, with carpet or burlap between sections to trap the heavy minerals, including gold.

Before prospecting on private property, one must obtain permission or a lease. On State-owned

land, prospecting and leasing are a matter of negotiation between the individual and the State agency concerned. A permit should be obtained from county or city officials when any prospecting is done on county or city-owned property. No prospecting is permitted in the national parks of Virginia, which are federally owned land. Information regarding property in the George Washington and Jefferson National Forests may be obtained directly from the Forest supervisors.

ACKNOWLEDGEMENTS

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Table 1.—Gold Production in Virginia and the United States in troy ounces. (Figures from editions of "Mineral Resources of the United States" by the U. S. Geological Survey and U. S. Bureau of Mines and the "Minerals Yearbook" by the U. S. Bureau of Mines.)

	Virginia	United States*
Early 1800's-1845	39,892	1,100,000
1846-1860	35,094	31,600,000
1861-1875	4,250	31,800,000
1876-1890	5,530	26,100,000
1891-1905	3,918	44,200,000
1906-1920	1,824	63,200,000
1921-1935	1,474	36,000,000
1936-1950	6,627	48,800,000
1951-1965	0	25,900,000
Total Production	98,609	308,700,000

* Production figures to nearest 100,000 troy ounces.

AEROMAGNETIC SURVEY OF CENTRAL VIRGINIA

An aeromagnetic survey that covers approximately 3360 square miles in central Virginia will be released on August 16, 1971 by the Division of Mineral Resources. The survey includes the following 15-minute quadrangles: Covesville, Scottsville, Front Royal, Sperryville, Rapidan, Gordonsville, Columbia, Lakeside Village, Jetersville, Crewe, Powhatan, Skinquarter, Wellville, the southern half of Fredericks Hall, and the northern half of Lawrenceville. The Powhatan, Skinquarter, Wellville, and Fredericks Hall quadrangles were compiled from published 7.5-minute quadrangles.

The magnetic contours are compiled on the topographic quadrangles at a scale of 1:62,500 or 1 inch to about one mile. The magnetic values were recorded at an altitude of 500 feet above ground level with east-west flight lines spaced at half-mile intervals. This survey joins two previous aeromagnetic surveys that were flown and released in 1969 and 1970.

The contour maps, which will be on open file beginning August 16 in the Division's library at Charlottesville, will be available for reference use. Ozalid copies, available for purchase at a cost of \$5.00 plus \$0.20 tax per map sheet, may be ordered from the Virginia Division of Mineral Resources, Box 3667, Charlottesville, Virginia 22903.

NEW PUBLICATIONS

Map. VIRGINIA, MINERAL RESOURCES OF, (1971), by D. C. Le Van and W. B. Harris. Generalized distribution of the mineral resources of the State is depicted on the map by color patterns and described briefly in the legend. Color edition; scale, 1:500,000 or 1 inch equals approximately 8 miles; size 30 x 60 inches. Price: \$2.75. Additional mailing charge for unfolded copy is \$1.00.

Report of Investigations 25. GEOLOGY OF THE BRISTOL AND WALLACE QUADRANGLES, VIRGINIA, by Charles S. Bartlett, Jr., and Harry W. Webb; 93 p., 1 map in color. Price: \$3.00.

Report of Investigations 26. GEOLOGY OF THE BASSETT QUADRANGLE, VIRGINIA, by William S. Henika; 43 p., 1 map in color. Price: \$2.75.

Report of Investigations 27. BOUGUER GRAVITY IN VIRGINIA, 36° 30' to 39° 30' N, 78° 00' to 79° 00' W, by Stanley S. Johnson; 40 p., 3 maps in color. Price: \$1.00.

Information Circular 15. A COMPUTER-PROGRAM SYSTEM TO GRID AND CONTOUR RANDOM DATA, by Stanley S. Johnson, Carol L. Huxsaw, and Dorothy R. Thomas; 38 p. Price: \$1.00.

DIRECTORY OF THE MINERAL INDUSTRY IN VIRGINIA—1971, by D. C. Le Van; 46 p. Price: \$0.25.

LIST OF PUBLICATIONS (1971), 46 p. No charge.

Note: A four percent (4%) sales tax is required on all publications mailed to Virginia addresses.

ADDITION TO STAFF

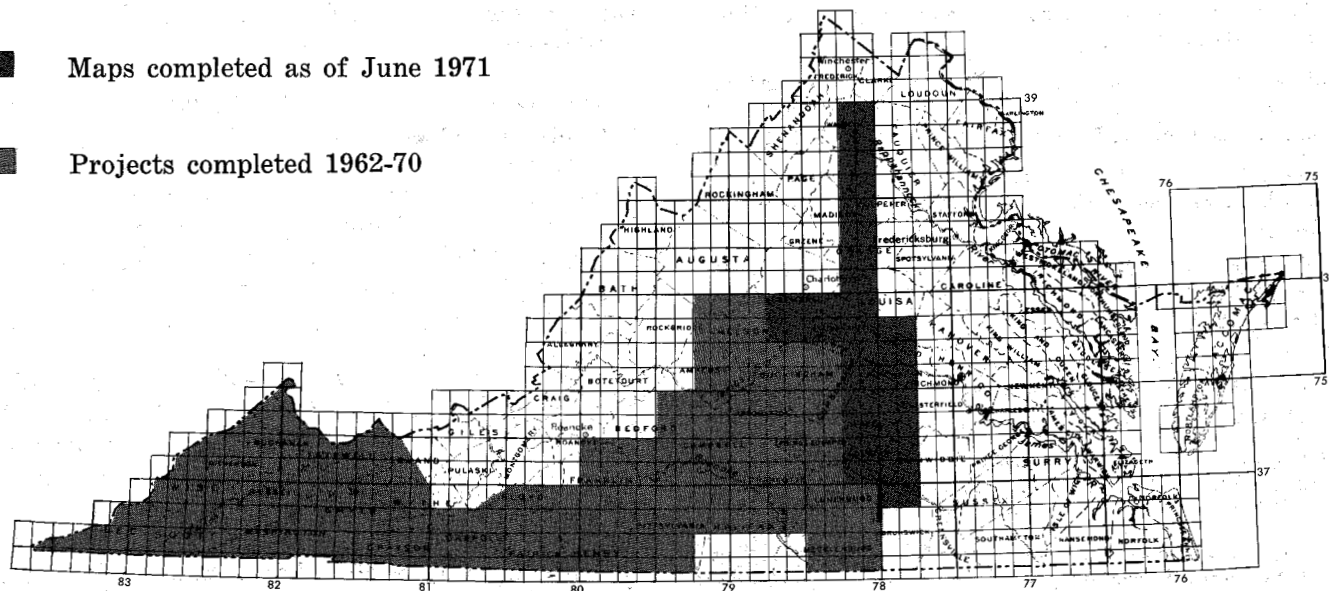
Emil Onuschak, Jr. was employed by the Division on May 15, 1971 and assumes responsibilities for structural, stratigraphic, paleontologic, and supplemental studies in the Coastal Plain area of Virginia. He received a B.S. degree in geology with honors from the Pennsylvania State University and a M.S. in geology from the University of Nevada. After additional studies at Johns Hopkins University, he worked for Shell Oil Company and Cities Service Oil Company for 10 years in Texas. He has had other field experience in the Appalachian, Midcontinent, Rocky Mountain, and Basin and Range regions. He is married and has two children.

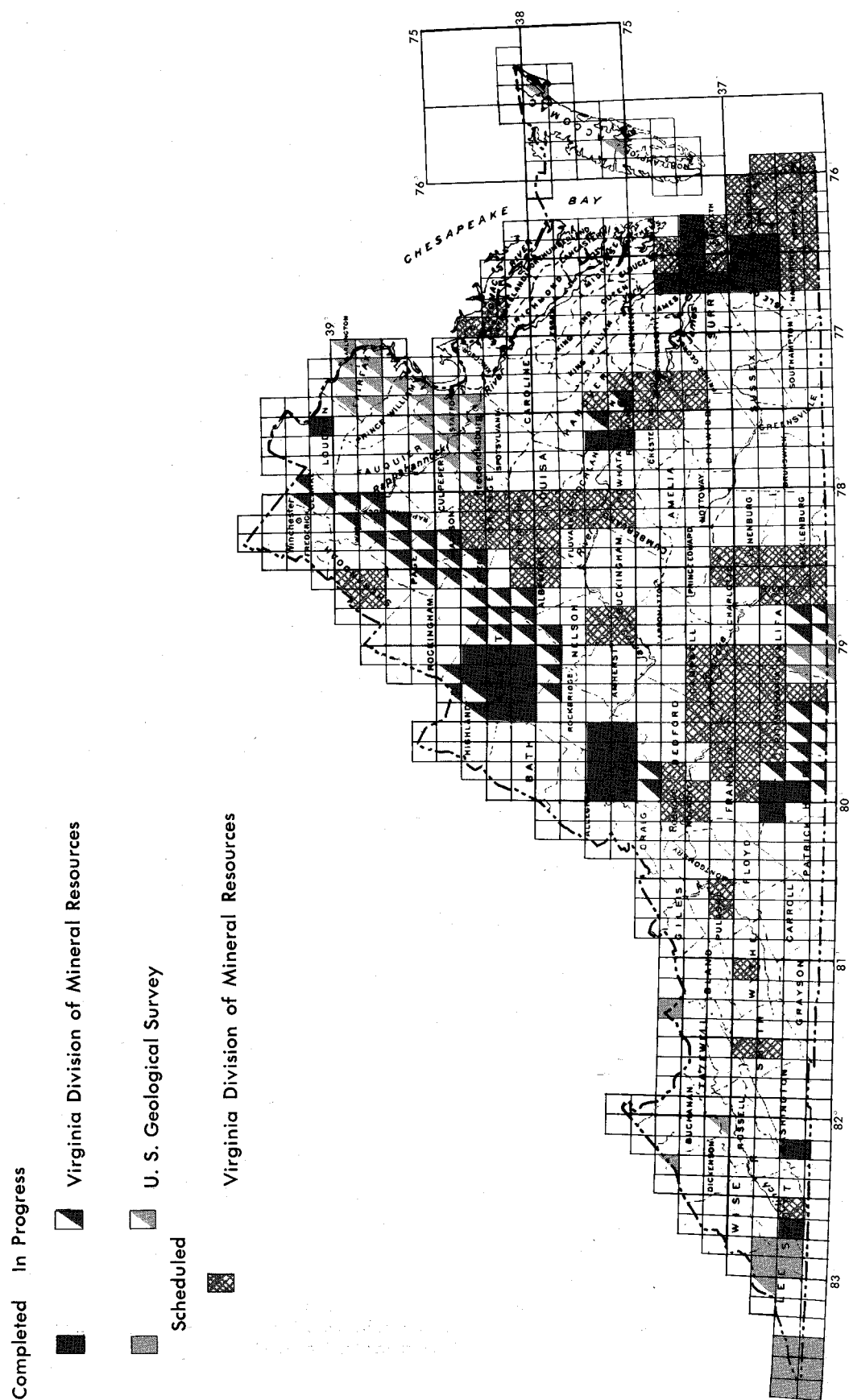
GEOPHYSICAL STUDIES

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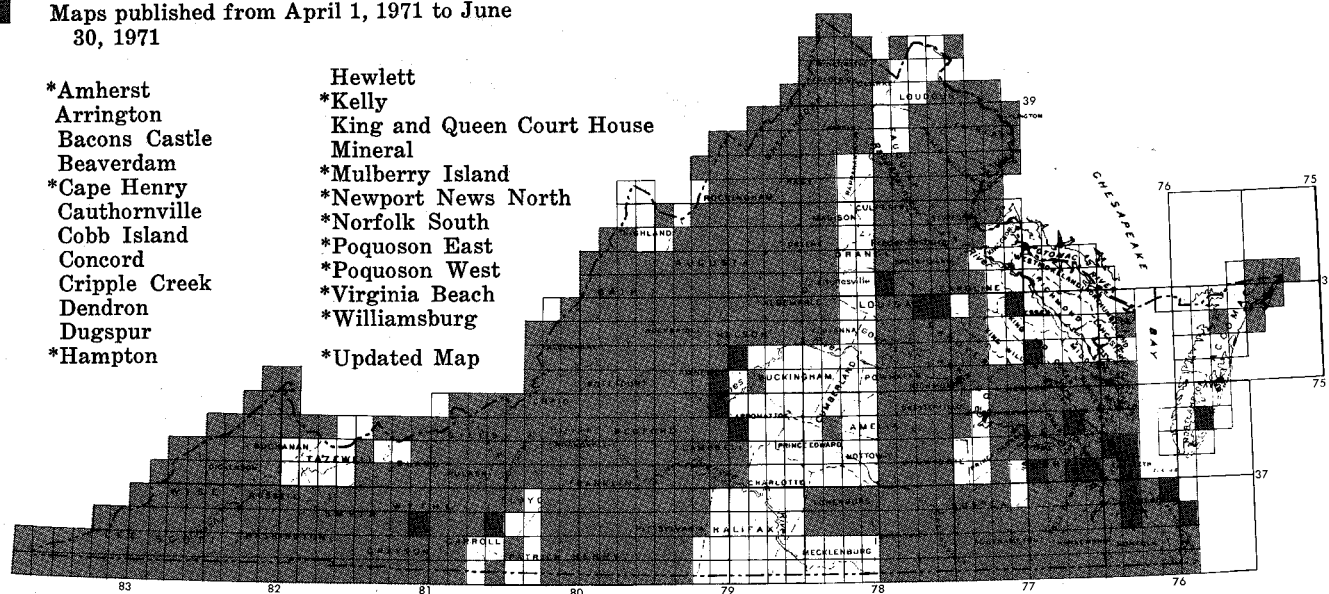
*Amherst
Arrington
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*Cape Henry
Cauthornville
Cobb Island
Concord
Cripple Creek
Dendron
Dugspur
*Hampton

Hewlett
*Kelly
King and Queen Court House
Mineral
*Mulberry Island
*Newport News North
*Norfolk South
*Poquoson East
*Poquoson West
*Virginia Beach
*Williamsburg
*Updated Map

As of June 30, 1971:

Number of quadrangles
Advance prints available
Modern maps published
Total number of available maps

Number of Quadrangles	Percent of State
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198	25
607	75
805	100



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Advance prints and copies of revision compilations are available at 50 cents each from the U. S. Geological Survey, Topographic Division, 1109 N. Highland St., Arlington, VA 22210.

PUBLISHED MAPS

State index is available free. Updated maps, on which recent cultural changes are indicated, are now available for certain areas of industrial, residential, or commercial growth. Published maps are available at 50 cents each from the Virginia Division of Mineral Resources, Box 3667, Charlottesville, VA 22903.